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FOREST INSECT INVESTIGATIONS

SUMMARY OF THE EXISTING SITUATION
RELATIVE TO THE
YELLOWSTONE PARK BARKBEEBLE CONTROL PROJECT
WITH
RECOMMENDATIONS FOR ITS FUTURE CONSIDERATION

by
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INTRODUCTION

A history of the so called Yellowstone Park Barkbeetle Control Project was prepared for those in attendance at the Forest Insect Conference held at Denver, Colorado, November 2, 1931. As this history is but a statement of past and existing facts, the following paper has been prepared for the purpose of presenting my analysis of the situation with recommendations for future consideration of this project. I trust that in the formulation of my decision I have been guided by the best interests of all concerned. The seriousness of the problem, which must be considered as being of national importance, is fully appreciated. The continuance of the project in its present form will call for large expenditures of public funds, with no assurance of success. Cessation of work will practically assure the destruction of valuable commercial stands, as well as seriously deplete the scenic forests of the Yellowstone. A decision in either direction is of serious importance and difficult to make.

PRESENT STATUS OF INFESTATION

On page 2 of this paper is shown a statistical summary of the Yellowstone Park project. This table includes the results of the 1931 surveys conducted on the various forest units of this project. Though

SUMMARY OF YELLOWSTONE PARK PROJECT

Forest	1929			1930			1931			1932		
	Acres	Trees	Funds	Acres	Trees	Funds	Acres	Trees	Funds	Acres	Trees	Funds
Beaverhead	:	:	:	:	:	:	16,234	5,870	22,976	15,104	32,030	65,000
Gallatin	:	:	:	:	:	:	:	:	:	35,840	6,557	14,354
Yellowstone	:	:	:	:	:	:	12,344	2,888	7,767	117,826	53,999	134,997
Targhee	14,800	31,204	16,469	67,948	30,064	28,449	102,670	32,316	42,571	438,000	119,874	165,000
Teton	:	651	:	4,000	4,515	3,062	4,500	4,762	6,717	:	1,400	4,601
Wyoming	:	6,945	4,834	60,800	17,160	23,509	105,000	17,055	57,645	48,339	11,993	44,510
Caribou	:	386	:	3,240	4,593	2,981	14,980	11,539	16,558	24,000	11,241	21,000
Cache	:	7,906	2,699	23,250	17,158	9,274	34,000	9,150	7,332	84,955	4,423	6,394
Totals	:	47,092	24,006	:	73,490	67,235	:	83,580	161,566	:	231,487	455,856

Total Trees

1929 - 47,092
1930 - 73,490
1931 - 83,580
1932 - 231,487

Total Funds

1929 - \$24,006
1930 - 67,235
1931 - 161,566
1932 - 455,856

the figures as shown present a rather clear picture of the situation, it is necessary to study each unit rather carefully in an effort to account for the rather poor results shown by past control operations. Though there can be no entomological separation of these forests, there is an administrative division which will be used in discussing the various units of this project.

FORESTS OF REGION 1

In discussing the forests of this Region, it is necessary to recall for a moment some past history. In 1928, the Big Hole Basin project, which was instituted in 1926 in an attempt to prevent the southern spread of the Montana epidemic, was discontinued as being no longer feasible. In a still further effort to prevent the spread of this outbreak into the valuable timber stands to the south and east, a new plan of control was adopted, utilizing the timberless region between the Beaverhead and Madison National Forests as a hoped for barrier. It was believed that this plan offered the best chances of success, as it was hoped that this timberless area would at least partially check the spread of the insects. In this plan, an annual survey of the areas south and east of the barrier was called for, as well as the prompt treatment of all infested trees located.

Madison National Forest

During the summer of 1930, infested trees were found in the southwest portion of the Madison Forest, and in the Sheep Creek Canyon, an isolated area of public domain lying between the Beaverhead and Madison Forests. By this time the infestation within the Beaverhead had spread throughout the

forests, and the units facing the Sheep Creek Canyon and Madison Forest were heavily infested. The infestation within the Sheep Creek Canyon and Madison Forest was treated in 1931 in the hopes that the continued spread of the insects could be held in these areas. In these control units, especially in the Sheep Creek Canyon and head of the Blacktail drainage, 1929-attacked trees were present in such numbers as to indicate that an above normal condition existed at that time. However, there was no doubt in the minds of those familiar with the situation but that the infestation within these units originated from a flight of beetles into the area. Therefore, the marked increase in the infestation which has been shown by the 1931 survey was not a surprise, but had in reality been anticipated. At this time there can be no question but that the mountain pine beetle infestation on the Beaverhead Forest is spreading into the Madison and will continue to do so until such time as the source of supply becomes exhausted.

Gallatin National Forest

Comments are hardly necessary for this forest. Most of the infestation lies in white bark pine, and old attacks indicate that the insects have been present within these areas for a few years prior to this time. I am making no attempt to explain the presence of the rather heavy spots of 1931 attacks. They could have originated from the normal infestation which existed prior to this season, or flights of insects into the area could have augmented this local condition into an epidemic or even developed the present status of conditions with no assistance from local insects. Though the answer

to this problem would contribute materially toward a proper decision as to future activity in connection with the entire project, it is one that can not be definitely proven. Regardless of such issues, we must face the discouraging fact that far ahead of our so called barrier, where control lines were to be held, spots of infestation now exist which are immediately adjacent to and seriously threaten the very areas within the Yellowstone for which protection has been sought.

FORESTS OF REGION 4

Targhee National Forest

Control measures have been conducted on this forest for the past four years. The source of the original infestation is, of course, unknown, and though we should like very much to know if it was of local origin or if it originated from long flights of insects, it is a question which can not be answered. At this time we are confronted not with the issue of the original source of this infestation but with the question of determining if insects are now flying into the areas from the infestation to the northwest, and if not at this time, will they do so in the near future.

In Region 4 the burning-standing method of control was developed to its present state of usefulness. Objections were at first made to this method of control, based upon the fact that the poor treatment of infested trees made the effectiveness of control difficult to measure. Improvements in this method of control were made both in the equipment and the technique of application so that in 1930 it was believed that a very thorough treatment of infested trees was secured, and a marked reduction in the infestation was expected to follow. The data secured from the 1930 fall survey

were very discouraging, as it was sincerely believed that a greater reduction should have been secured. This lack of results could only be explained by two thoughts, which were poor treatment of infested trees, or by either long or short flights of insects into the areas. On the chance that the reinfestation occurred from untreated infested bark surface within the areas covering in 1930, control work was again recommended for these units in 1931, as it was believed that the seriousness of the situation justified such action. In connection with the 1931 operation, in order to throw more light upon the source of reinfestation, greater stress was to be placed upon the thoroughness of control work. A thorough clean-up was called for, with the felling of all trees which could not be satisfactorily treated while standing. All infested areas were to be located and covered by control, so that it might truthfully be felt that if these areas were reinfested in the summer of 1931 it would not be from the poor treatment of infested trees.

In the past three years I have spent some time on several of the areas within the Targhee Forest, and have only the highest opinion of the officers in charge of the work. For the past two years I felt, and do yet sincerely believe, that the excellent work which these men were doing should have resulted in a far greater reduction in the infestation within the treated areas than they have secured. In computing the percentage of increase or decrease following the institution of control, one can not use the number of treated trees as a basis from which to work. Treated trees cease to become potential sources of reinfestation so that attacks which originated within control units must come from untreated infested

bark surface. Though I do sincerely believe that the potential danger of the missed tree has been underestimated, I do not believe that the amount of untreated bark surface left on the areas following last spring's operation was sufficient to produce the 1931 infestation. However, it is recognized that as yet data showing the actual reduction secured on these areas are not available.

To again face existing conditions as revealed by the 1931 survey on the Targhee, it is rather conclusive to me that insects are flying into the treated areas. Such flight may have come from untreated areas adjacent or they could have come from remote regions. I make no attempt to answer this issue, as it is a mooted question and one that can not be answered. Nor can it be said that new areas of infestation are being formed within the Targhee by flight of insects from remote regions, though at this time I am frank to say that I am of that opinion. Regardless of these many issues, which will always remain as such, an infestation exists within the Targhee Forest of startling magnitude - an infestation which borders the Yellowstone Park, for which protection has been desired, and in considering the future of this project it would seem that the entire forest would need be covered by 100 per cent control.

Other Forests of Region 4

I regret that I can not comment more fully upon conditions within the Teton, Wyoming, Caribou, and Cache National Forests. I was not privileged to spend a great deal of time within these areas, so I am obliged to confine my reaction to existing data, which I realize may not fully depict the complete situation. With the class of control work which I sincerely feel was performed in these forests during the spring of 1931, it

would seem that a much larger reduction in the infestation should have followed. Again, it is impossible to isolate the source of this infestation without a thorough field study of existing conditions. Any statement attempting to answer this question without more data than is now available would be a mere guess. Again, it is sufficient to say that we are faced with the infestations within these forests, and that our concern is not with past history, but with what the future may hold in store for us.

YELLOWSTONE PARK

Since the institution of control work in the Big Hole Basin in 1926, the protection of aesthetic timber stands within the Yellowstone has been used as the primary objective to justify the necessary expenditures. In connection with control plans for 1930, an aerial survey of Yellowstone Park was made to determine if there were any infested areas within the region for which protection was especially desired. Though a few scattered red tops were observed, there were no large groups, nor were red-tops observed in sufficient numbers to be considered as alarming. Later in the season 1930-attacked trees were found in the southwest corner of the Park, and plans immediately made to treat them the following season. Again in 1931 the aerial survey was repeated, but at this time groups of red-tops at several points within the Park were observed. These spots were immediately checked by ground examinations and all of the infested regions were covered by a survey later in the season. This survey disclosed the startling information that some 53,000 trees had been attacked by the mountain pine beetle in 1931. Regardless of the source of this infestation, it

is sufficient to say that it now exists in an epidemic status. Dead trees within these areas indicate that the insects have been present for some time. One can not say that this condition did or did not develop locally. The fact^{is} that there now exists a serious infestation within the area for which protection would seem to be of sufficient importance. This outbreak must of course be cared for in any further plans of control.

CONCLUSIONS AND RECOMMENDATIONS

As previously stated, the seriousness of formulating recommendations for the future consideration of this project is fully appreciated. To me the future of the project rests upon the question of insect flights into the Gallatin, Yellowstone and Targhee. If we are concerned only with existing 1931 infestations with the project area, then I sincerely feel that the expenditure of the funds called for in 1932 would be justified. However, if flights of these insects have occurred, or will occur in the near future, the problem assumes a different aspect. In support of these arguments evidence can be truthfully offered for either side, and it is indeed difficult to draw one's conclusions. As against the theory of insect flights I point to the marked reduction secured on that portion of the Targhee known as the "Point". Of course, exponents of the flight theory could say that this was due to the fact that no insects flew into that unit in 1931. So, as I say, it is extremely difficult to satisfy oneself in the formation of such an important opinion, and I find myself influenced by what I know has occurred on the Bitterroot, the Beaverhead, and is now taking place on the Madison.

In continuing this project, flights of insects into the Yellowstone Park and immediately adjacent forests will become an even greater factor

than we had anticipated, and the so called timberless barrier between the Beaverhead and Madison will have little effect in preventing the devastation of the areas to the south and east. Though I am firmly of the opinion that such flights have already occurred, I feel that this position can well be dismissed from further consideration in this summary, as we are not concerned with the past, but with what I feel safe in predicting will occur in the future. With definite assurance that the beetles are crossing the timberless region from the Beaverhead into the Madison, it must be assumed that these flights will continue, spreading a greater distance each year and complicating the results of control within the Yellowstone and adjacent forests, until it is possible that a point will be reached that will make further prosecution of the work an impossibility.

With the above realization I feel that it is necessary to change our conception of this project from a "clean-up operation," which we had hoped it would prove to be, to what must be called a "holding plan of control." Under such a plan it would be necessary to carry on control measures within these areas for a number of years for the purpose of treating all infested trees which might occur, until such a time as the source of supply became exhausted. To foresee the period of time over which such a plan would need be spread is impossible, but in this instance one may be assured that it would be for five years at least. There are 12,000,000 trees infested at this time on the Beaverhead, with perhaps an even greater number on the Salmon, which must be considered as potential sources of supply. There seems no need to comment upon the difficulties, expense, and discouragements of such a plan of control. Areas thoroughly

cleaned by control would be reinfested annually. Furthermore, we have behind us the sad experience of being unable to cope with the heavy waves of infestation, when the main bodies of the advancing infestation reached the control units.

In forming my recommendations relative to the future of this project, I have not weighed my decision against the financial requirements of the project. My interpretation of my task is to set forth the entomological future of this project, leaving the decision as to the values of the timber at stake with the agencies responsible. In the past, experimental values have been balanced, openly it is true, against the financial requirements of projects. However, when the expenditures reach the magnitude of the one we are now considering there would seem to be no place for such considerations. The seriousness of the problem can hardly be overestimated. To a large extent the scenic values of the Yellowstone forests, as well as large bodies of commercially valuable timber, are at stake. To discontinue control at this time is to assure this destruction, as the infestation already present within these forests constitutes a potential epidemic sufficient to destroy all timber values without assistance from insect flights. On the other hand, the continuance of the project will for the next five or more years call for large expenditures of public funds, with little assurance of being able to preserve the timber values at stake. In considering the future of this project, no assurance of success can be offered. In fact, the weight of evidence, based upon past experiences, would strongly indicate that failure would follow such efforts. However, no one can say that if this project is continued in its present form there would not be a chance of success. I feel

that it would be a gamble with the odds against success. It is true that a break in this epidemic, due to natural agencies, may occur at any time, which would of course be in favor of control. We have played for several years in the hopes of such a break but without success. To count on such an occurrence is indeed a gamble, but to me it would seem to spell the only chance of success. Though such a "break" is possible, the tremendous expenditure of public funds would seem to forbid the taking of any such chances. However, the decision on this issue should rest with the agencies responsible for the timber values at stake.

I realize full well the seriousness of the position I am taking, and sincerely trust that if I am in error my recommendations will be disregarded, and that from further control work my position will be proven to be false. Regretting most fully that I see my position as I do, to the best of my ability I must recommend that the present Yellowstone Park bark-beetle control project be discontinued as offering no hopes of entomological success. This position is but my own reaction to the existing situation. It may be in error, but I feel that I would be remiss in my duty not to state my position as I sincerely believe it to be.

Respectfully submitted,

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